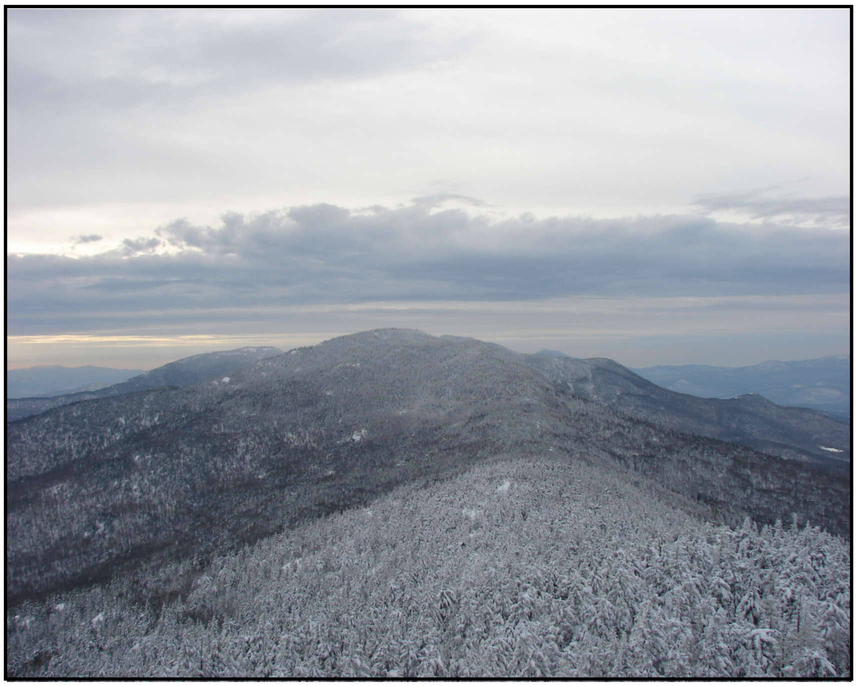
North Country Clipper



Bi-Annual Weather Newsletter

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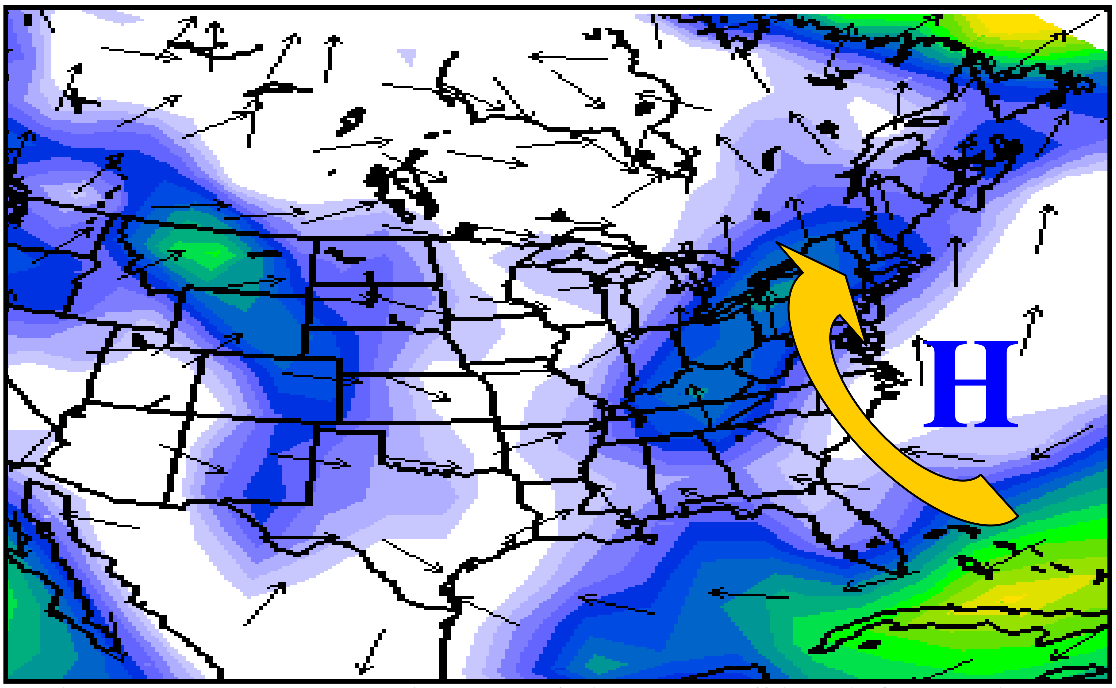
From your North Country's National Weather Service office in Burlington, Vermont

North Country Winter Thaws

By Donald Dumont

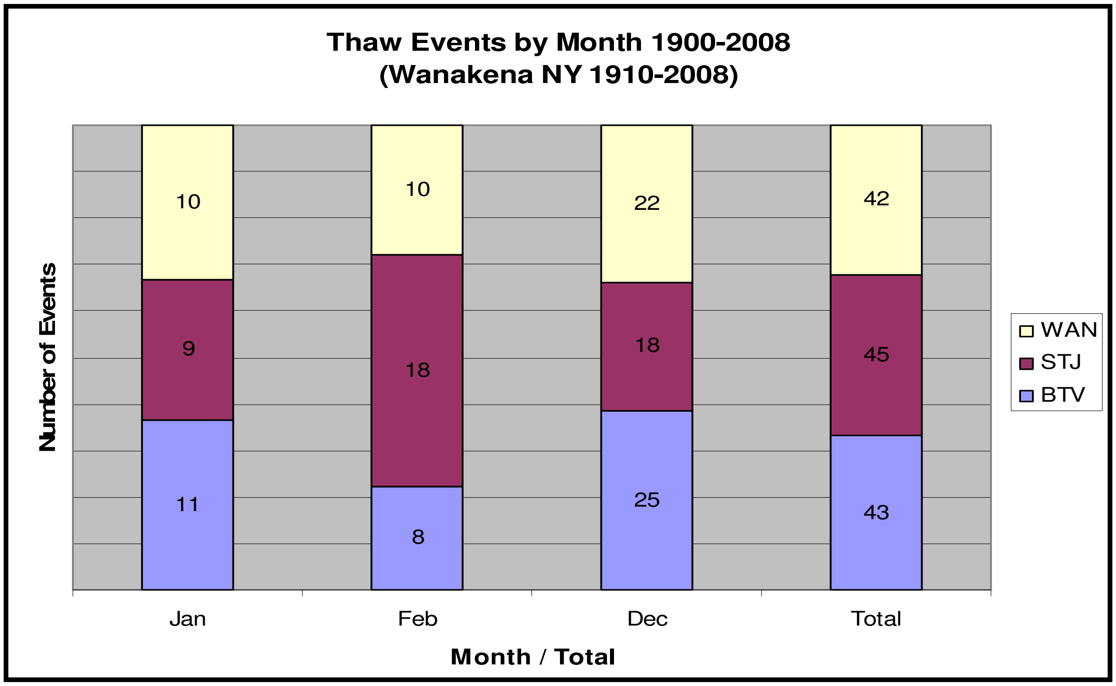
Winter thaws have always been a common occurrence in New England over the past century, so common that weather terminology such as “January Thaw” is now normal verbiage. The geographic location of New England being so close to the relatively warm waters of the Atlantic Ocean (even in winter) is the main contributor to these brief and usually welcome warm spells. A typical winter thaw weather pattern is having a persistent area of high pressure located off the eastern seaboard of the United States (see image below). This allows warm southerly winds from the Deep South to move up the Atlantic Seaboard and into New England. If the weather pattern persists for multiple days, a winter thaw will occur.



Winter Thaw Weather Pattern with an area of High Pressure off Atlantic Coast causing warm Southerly winds over the Northeast United States.

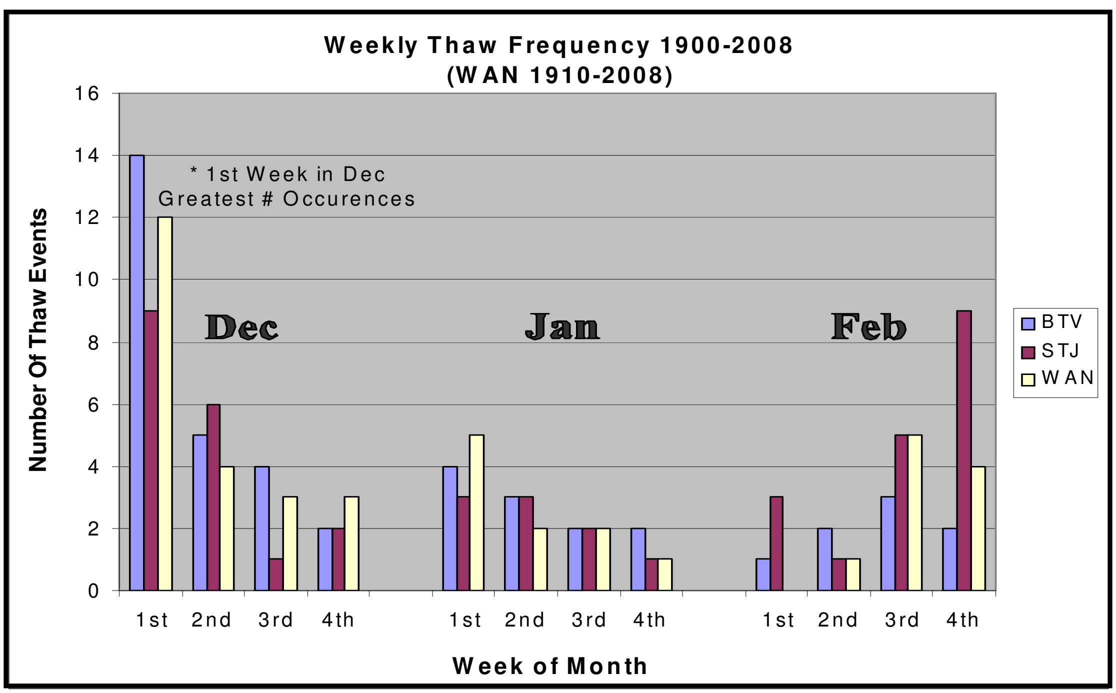
Recent research done at WFO Burlington indicates some interesting findings in the frequency of winter thaws across the North County. Three locations were selected for the study based on their length of meteorological records and geographic location. The locations were Wanakena (WAN), NY, South Burlington (BTV), VT and Saint Johnsbury (STJ), VT. A winter thaw event was defined as 3 days where the average high temperature was greater than 50 F. Data for the months of Dec., Jan., and Feb. were looked at from 1900-2008, except at Wanakena where records only went back to 1910. The month of March was not used due to the high frequency of thaw events from the middle of the month on.

The image below shows how many thaw events have occurred over the past century at WAN, STJ, and BTV. The right side of the figure indicates the total number of thaw events and you can see that the number of occurrences is almost equal at all three locations. When thaw episodes are broken down by month, the highest occurrence is in December and least likely in January and February. The period of record for this data is 108 years and the total number of thaw events is around 44 on average. This indicates that a winter thaw of this caliber doesn’t occur every winter but usually once every two years.

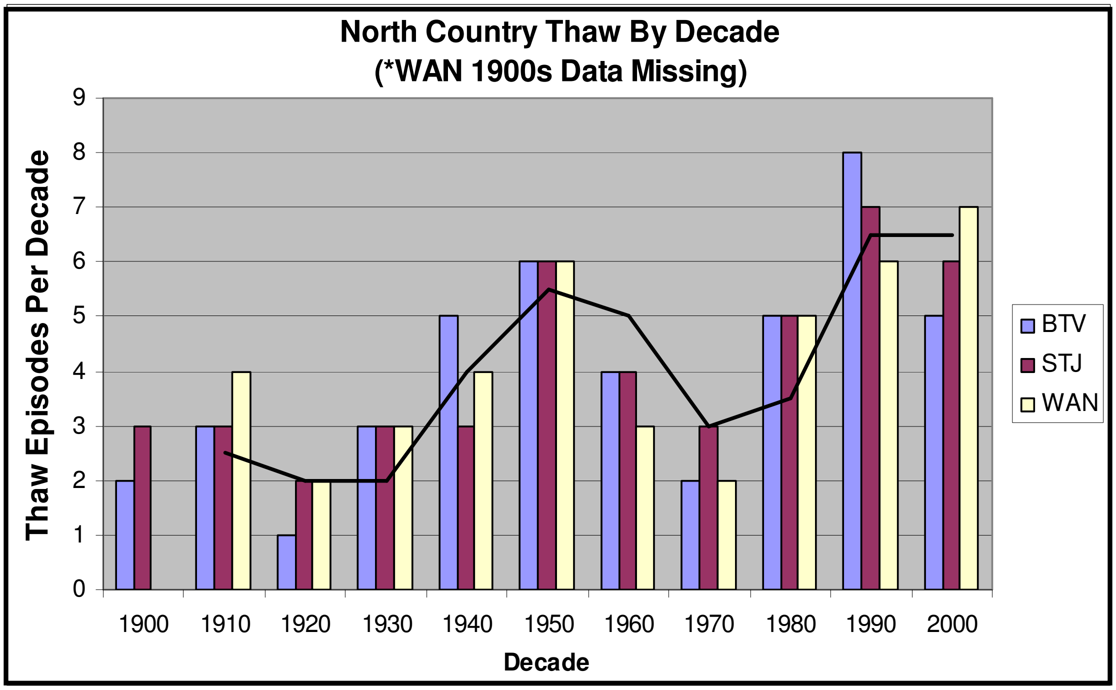


Winter Thaw events across the North Country

When the data is broken down by weekly thaw events (image below), you can see that the highest frequency of occurrence is during the first week of December and the last two weeks of February. Thaws occur the least during the late January through early February period. There is another small peak of thaws in the first week of January, providing some reasoning for the "January Thaw" expression. The likely reason for all the thaws in the first week of December is the average high during this week is still in the upper 30s, but by the end of December the average high is only in the upper 20s. By late February, solar insolation is increasing and the average highs are already approaching the freezing mark. The minimum thaw event weeks correlate nicely with the climatological coldest weeks of the year for the North Country (late January through first week of February).



Looking at the occurrence of winter thaws by decade (image below), we can see that winter thaws occur more often in certain decades than others. During the beginning of the 20th century winter thaws were not as common, occurring once every 4 years on average from 1900-1930s. During the middle of the 20th century thaw episodes increased with a peak in the 1950s, where a winter thaw occurred 6 out of 10 winters. Thaws then decreased through the 60s with another low point in the 1970s when thaw episodes became similar to the beginning of the century again. By the end of the century thaw episodes became more common with the highest regularity of thaws over the past century occurring during the 90s, when a thaw episode happened almost every winter. The trend during the beginning of the 21st century continues to be active with a thaw occurring every other winter.



Number of winter thaws per decade for Burlington, Saint Johnsbury & Wanakena

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Flash Flood Monitoring and Prediction

Tools for Flash Flood Warnings

By Greg Hanson

The North Country experienced a relatively quiet end to the winter season from a hydrologic standpoint. There were some minor ice jams in the early and mid winter time frame, but otherwise the spring melt has gone very smoothly. River ice mainly melted in place, with no springtime flooding from ice jams or snowmelt. Although snow remains over the higher elevations, the overall coverage has decreased such that the remaining snow is of little hydrologic consequence.

With the spring thaw out of the way, attention now turns to the main summertime flood risk: flash flooding from torrential thunderstorm downpours. To assist the forecasters, The National Weather Service in Burlington, VT employs a flash flood forecast and warning tool called FFMP, or **F**lash **F**lood **M**onitoring & **P**rediction. FFMP is a computer software package that compares radar information and rainfall flash flood thresholds, to clearly display small streams that are under the greatest threat of flash flooding. Before FFMP came along, forecasters were mentally juggling the comparisons between radar data and flash flood thresholds, and issuing Flash Flood Warnings for larger areas than were necessary.

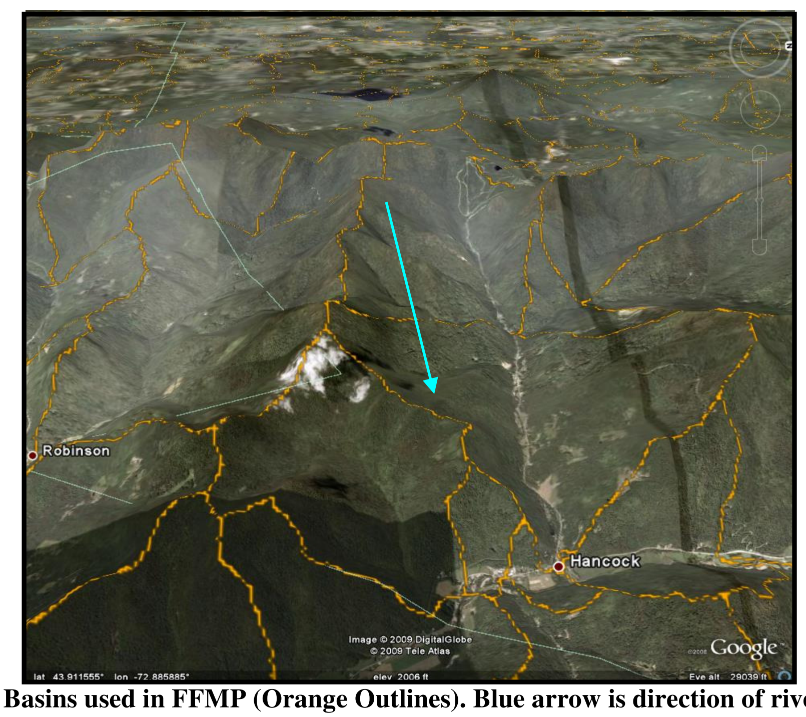
The two main benefits of FFMP are:

1. **The automatic comparison of radar rainfall estimates to the rainfall thresholds, or flash flood guidance**. Depending on the intensity and duration of the rainfall, forecasters can look at time durations anywhere from a half to six hours or more. If rainfall exceeds the flash flood guidance amount (or amount of rain needed to cause flash flooding), the forecaster is alerted by changing colors on the display map.
2. **The second benefit of FFMP is its ability to highlight the specific small stream basins that are at risk of flash flooding**. Before FFMP came along, forecasters would issue a Flash Flood Warning, and mention several towns that might be impacted by Flash Flooding. FFMP keeps track of the rainfall estimates over smaller river basins, and forecasters use this information to identify specific creeks and streams that are at risk of flash flooding. When a Flash Flood Warning is issued, the forecaster can list local roads and highways or other landmarks that may be impacted.

To work properly FFMP needs three things:

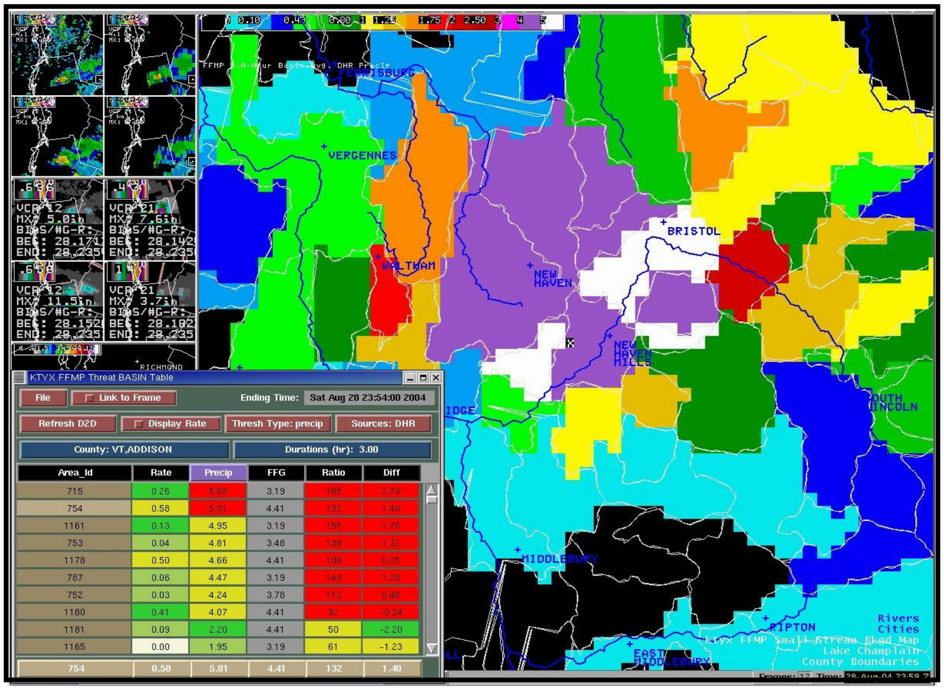
- Accurate maps of small stream basins
- Radar rainfall estimates
- Flash Flood Guidance

The small stream basins are defined using Geographical Information Systems (GIS) software. When all is said and done, each individual basin is only 3 to 5 square miles in size on average due to the hilly terrain across Northern New York and Vermont. The image below is an example of basins overlaid in Google Earth. Rain that falls inside one of the small basins runs off to the stream that flows through the basin. In this case, all the water that falls in the two basins with the blue arrow ends up in Hancock VT.



Small Basins used in FFMP (Orange Outlines). Blue arrow is direction of river flow.

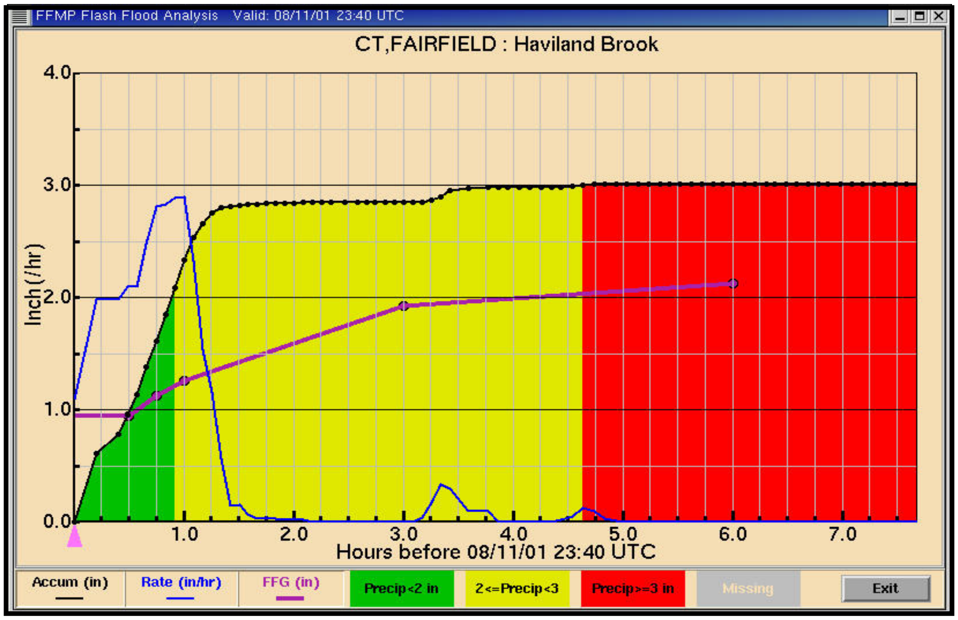
Radar rainfall estimates have been one of the more useful tools of the Doppler Radar used by the National Weather Service. FFMP changes the way we look at the radar rainfall estimates by averaging them over the newly defined small stream basins. The total amount of rain that falls in each small basin is determined, pinpointing the areas with the greatest flash flood risk. The image below shows what the FFMP display looks like during a heavy rain event. Rainfall estimates for each individual small basin are displayed. In this case, basins colored white have received 5 inches of rain over the entire basin, and purple basins have received 4 to 5 inches of rain. Rainfall totals are also displayed in the table in the lower left.



FFMP Rainfall Estimate Display

The final element needed in FFMP is Flash Flood Guidance. Flash Flood Guidance (FFG) is calculated at the NWS Northeast River Forecast Center in Taunton MA. FFG is an estimate of the amount of rainfall needed over time to produce flash flooding. If the FFG value is 2.5 inches in a three hour period, then a forecaster looks for areas that receive over 2.5 inches of rain in three hours to identify a flash flood risk. FFG can change on a daily basis, becoming lower (less rain needed for flash flooding) if there has been recent rainfall, or higher (more rain needed for flash flooding) if there has been a long dry spell. FFG also varies based on terrain, soil types, and even urban development. FFG will usually be lower in the mountains, and higher in flat farmland.

FFMP makes the comparison between radar rainfall estimates and Flash Flood Guidance for the forecaster and the comparison can be displayed on a map similar to the image above, or in a graphical representation for a specific basin like the image below. This graph is used to compare rainfall estimates (black line, and green, yellow, and red shaded areas) to Flash Flood Guidance (purple line). The radar rainfall estimate (black line) is higher than the flash flood guidance (purple line) and a Flash Flood Warning may be needed. The map is very useful for a broad overview and the graph is used to pinpoint a specific threat in an individual basin.



FFMP Basin Trend Graph

During rainfall episodes, FFMP makes these calculations on all the small stream basins in Vermont and Northern New York, as often as every 4 minutes. FFMP can even be configured to alert a forecaster to a potential flash flood threat and help with the overall situational awareness of a heavy rainfall event.

Even with the all the automated features, the technology in use has limitations that the forecaster has to constantly keep in mind. There is still plenty of room for the forecaster to evaluate the information, and have final say on whether or not a warning is needed. Radar rainfall estimates and Flash Flood Guidance may be too high or too low for a number of reasons. However, even with the limitations, FFMP is an incredibly useful tool to quickly identify areas with the heaviest rainfall, and quickly zero in on the greatest flash flood threat.

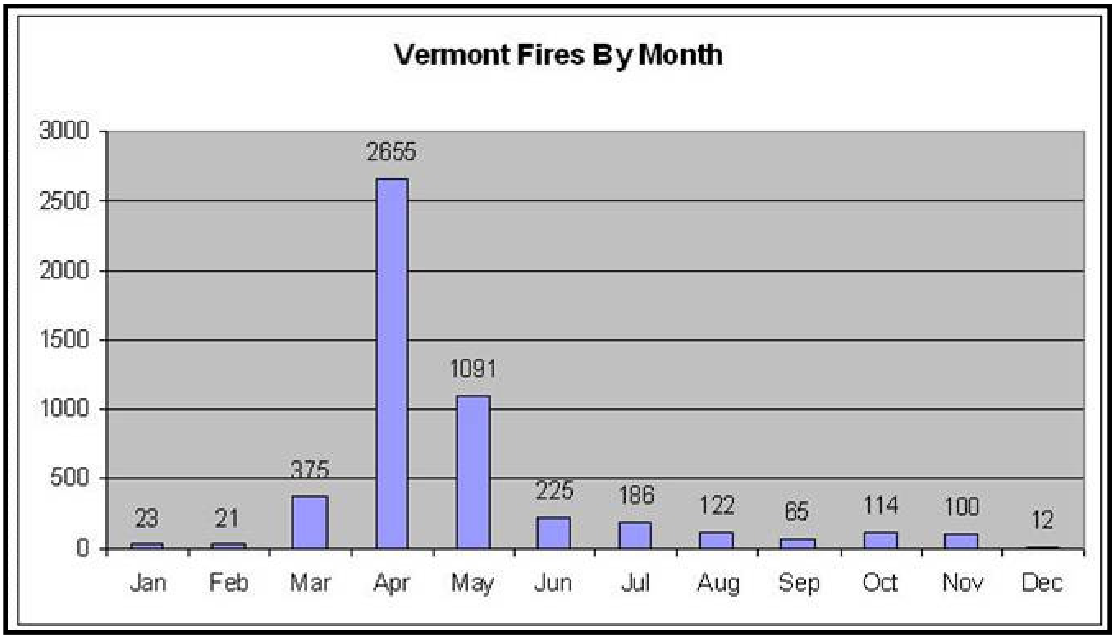
Fire Weather in Vermont & New York

By Eric Evenson

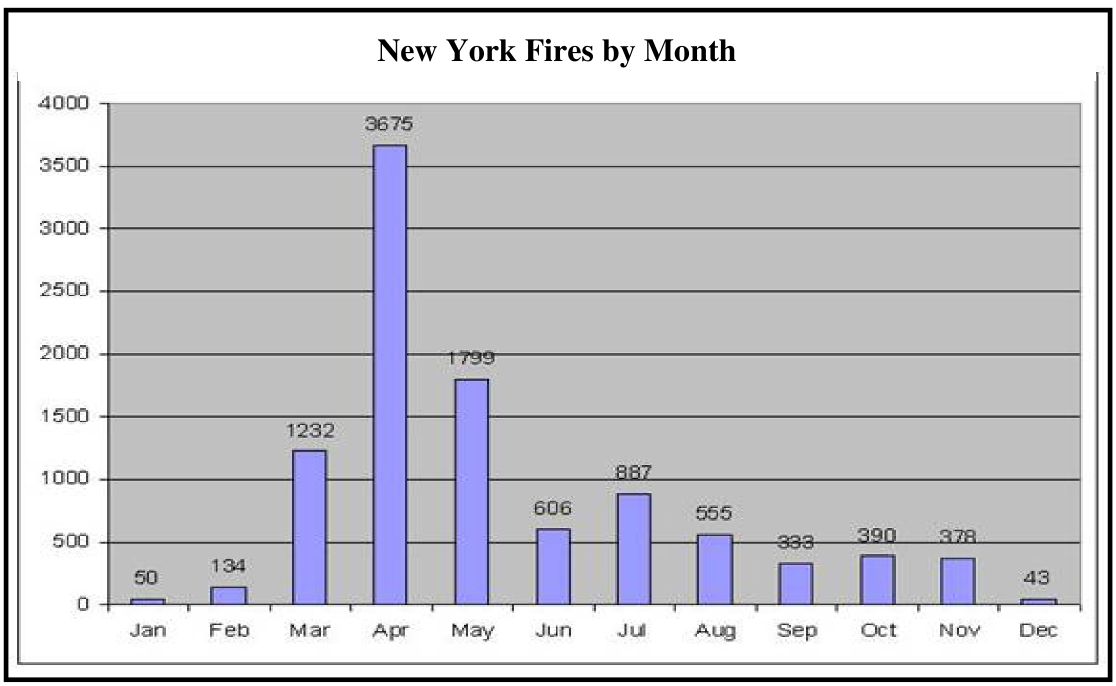
A climatology of wildfires in Vermont and New York has been developed using data from the New York State Forest Rangers (31 years from 1975-2006) and the Vermont Department of Forests, Parks, and Recreation (27 years from 1980-2007). It has to be noted that with respect to the wildfire database in New York State, the data only represents wildfires that New York Forest Rangers were associated with. Fires handled by local fire agencies in New York are not included in this database. For the state of Vermont fire data, the database consists of known wildfires reported to the Vermont Department of Forests, Parks, and Recreation.

Number of Fires: In the period from 1975 through 2006, the New York State Forest Rangers responded to 10,082 fires, which makes for an average of 315 fires per year. The highest total in any given year was 673 fires (1999) and the lowest total came in 1996 with 81 fires reported. In Vermont from 1980 through 2007 there have been 4989 known fires reported for an average of 178 fires per year. The highest total in any given year was 370 fires (1985) and the lowest total came in 2000 with only 31 known fires reported.

Monthly Distribution: Examination of fires by month shows both Vermont and New York having the highest occurrence of fires in April and May. In Vermont, 75 percent of all fires in a given year occur in April and May (see graph below). In New York State, 54 percent of all fires in a given year occur in April and May. Therefore, the peak fire season in Vermont and New York is April and May.



Vermont Wildfires by month from 1980-2007

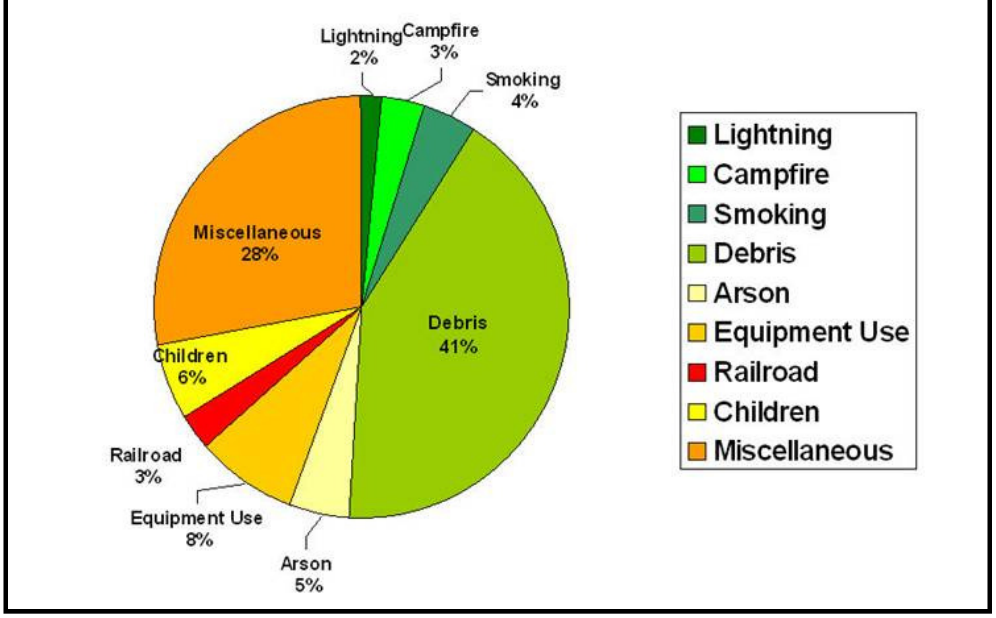


New York Wildfires by month from 1975-2006

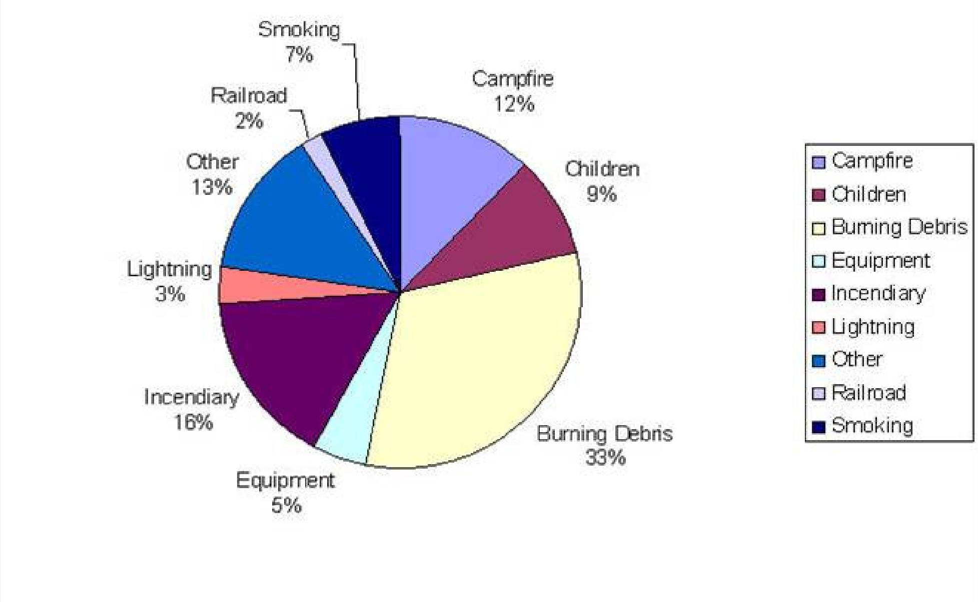
Acreage Burned: On average, 95 percent of all fires in Vermont burn less than 10 acres. In fact, 91 percent of all fires burn less than 5 acres and nearly 60 percent (59%) of all fires in Vermont burn less than an acre. The largest fire reported in Vermont between 1980 and 2007 was a 350 acre fire in Leicester (Addison County) on October 30th, 1982. With respect to New York State, 89 percent of all fires burn less than 10 acres. The largest fire reported in New York occurred on August 24th, 1995 at Riverhead in Suffolk County on Long Island which burned 5,050 acres.

Causes: In both New York and Vermont, burning debris is the number one cause of fires. In New York, burning debris accounts for 33 percent of all fire starts and 41 percent of all fire starts in Vermont. Weather related causes such as lightning account for only 3 percent of all fires started in New York and only 2 percent in Vermont. The below pie graphs explain in detail how wildfires are caused in Vermont and New York by percentage of all fires reported.

Vermont Wildfire Causes 1980-2007



New York Wildfire Causes 1975-2006



Coinciding with the peak fire season in Vermont and New York, the months of April and May, is the fact that the area is in a pre-greenup phase. This is when the ground is bare, brown, and dry due to dormant grasses, dead leaves, needles, and small brush. These materials are fuels that can dry very quickly under full sunlight, warming temperatures, low relative humidities, and wind. If a fire were to start in these conditions, it could quickly spread out of control due to the highly flammable and readable available ground brush fuels.

The photo below is an example of dry, fine dead fuels before spring Greenup in Essex, Vermont (April 2005). Note the smoke from a fire near the foothills of the Green Mountains. The clear skies indicates a typical fire weather danger day with high pressure over the region resulting in several factors to help dry the fine fuels, full sunshine, no precipitation, and low relative humidities. Notice the snow in the higher elevations of the Green Mountains. This is typical of the spring fire season, with the fire threat beginning in the lower elevations first, then slowly rising in elevation later in the spring.

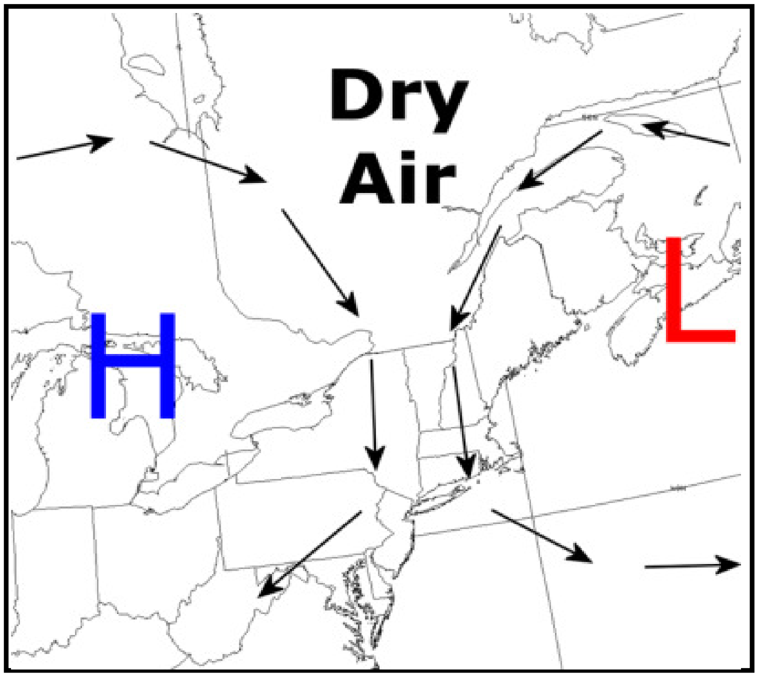
Example of dry fuels during the spring before pre-greenup

Forest agencies such as the Vermont Department of Forests, Parks, and Recreation, and the New York State Forest Rangers monitor fire danger. Fire Danger examines the state of the fuels and weather conditions. These elements determine how easily a fire could start, how fast it would spread, the difficulty it would take to control the fire, and the fires impact on the forest and human structures. Fire Danger can range from the Low category indicating fires do not readily start, to the Extreme category which indicates any fire that do start would spread quickly and burn intensely.

The National Weather Service in Burlington, Vermont issues daily fire weather forecasts for forestry personnel and the general public. This product provides important information related to such elements as temperature, humidity, winds, and other elements related to fire weather. When critical fire weather conditions such as low relative humidities, strong winds, and extended periods of little or no precipitation develop in combination with dry fuels, the National Weather Service calls that a red flag event. If the potential exists for a red flag event to develop, a Fire Weather Watch will be issued. If a red flag event is expected, a Red Flag Warning will be issued. These products alert you to the fact that personal property and firefighter safety could be significantly impacted if a wildfire were to develop.

Rutland County Fire April 2008

The National Weather Service in Burlington, Vermont monitors weather patterns for situations that would have an impact on fuels and fire. One common pattern found during peak fire season has a high pressure system building down into the region from central Canada. This system will bring dry air into the area, lower relative humidity values, and dry the dead fuels already on the ground. Clear skies typically accompany these systems and cause the fuels to dry even further. Gusty northwest winds can also be found in this scenario that can help a fire spread rapidly if one were to develop. The image below shows a favorable setup to bring the critical weather conditions described above into the region.



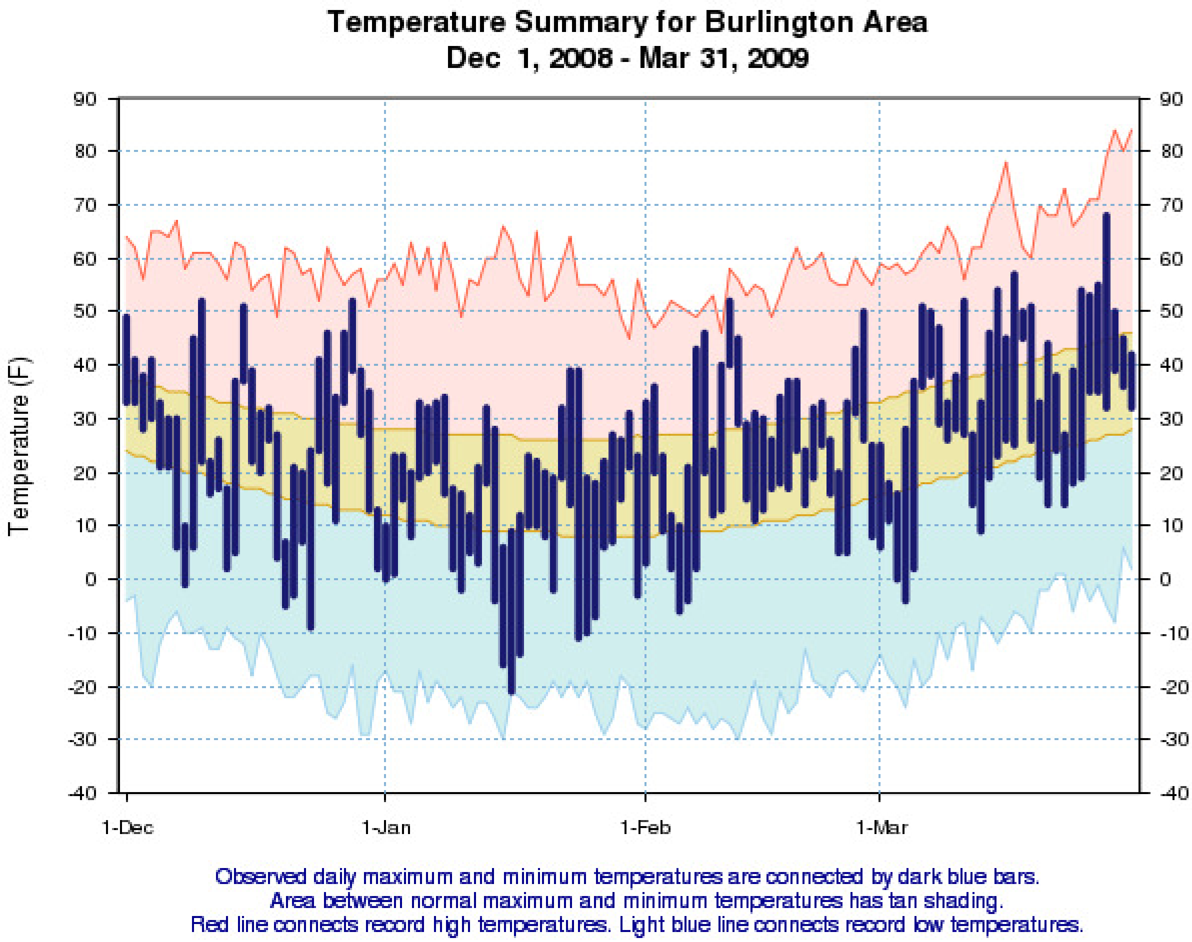
Normal Spring weather pattern that brings clear dry weather to the North Country

This is a favorable weather situation which can easily impact open burning. Setting fire to debris or brush pile in these conditions could result in more intense burning since the fuels have become even drier. If gusty winds exist, burning embers could be transported further away from the debris or brush pile and start a new fire in any dry fuels lying on the ground. The wind would also help spread that new fire. It is important to stay situationally aware of weather conditions; especially during spring clean up if you plan on burning brush. Always contact your local fire warden to get a burn permit, as they will be aware of any fire weather/burning concerns.

Winter 2008-09 Wrap-Up

By Donald Dumont

The best way to summarize this winter in the North Country would be to call it “variable”. But if you look at the climate averages for the city of Burlington, winter snowfall was just above average with a total of 91.1 inches compared to the normal 83 inches. The average temperature for Dec.-Mar. was 23.6 F, only 0.4 degrees above average. Looking back 20 years from now the seasonal climate record will show this winter as “normal” but as the saying goes; climate is just the average of the extremes. This winter did have extremes with highly variable warm and cold snaps, snowy months, and virtually no snow in other months. The graph below represents the daily temperature ranges for Dec.-Mar. this past winter. You can see the large swings from below average temperatures to above average temperatures. December alone had four above and four below average periods. This variable pattern of temperature swings continued through the remainder of the winter.

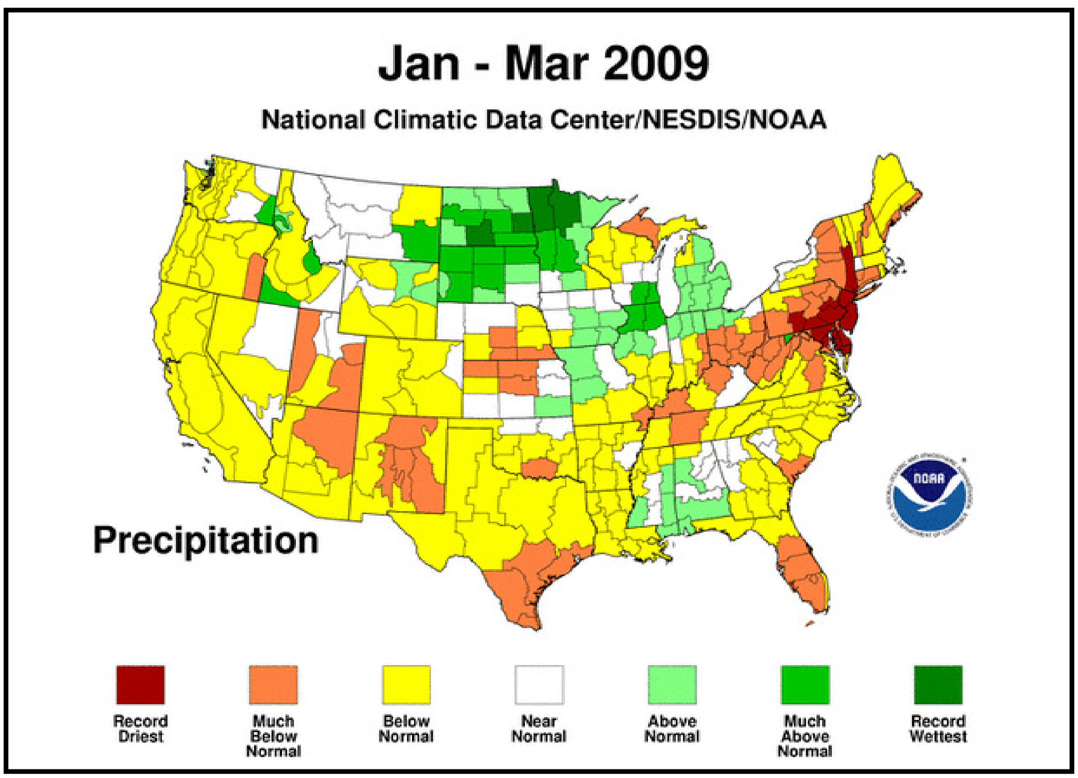


Winter started off above average, with 40.3" of snow at Burlington, 49.6" at St. Johnsbury, 43.5" at Tupper Lake, and 37" at Rutland. The interesting thing about the snow was the low water content or "fluffiness" of the snow. At Burlington the liquid to snow ratio for the month was 18 to 1, meaning when you melt 18" of snow you would have 1" of rain. The higher the snow ratio the more settling occurs, and the easier it is for the snow to melt. The combination of the low water content snow and warm spells ended up melting all the snow, causing the ground to be bare at the end of December, even with 40" for the month. Most of Vermont and Northern New York did finish up the month with a snowpack, but it was less than 6" at most valley locations and even the Mount Mansfield snow stake had only 33" after an above average snowfall for Nov and Dec.

January started off near average before the coldest arctic weather outbreak of the past few years gripped the North Country during the third week of the month. During this week the coldest low temperatures of the winter was recorded, with a -21F reading on the 16th of January at South Burlington Airport. The last time a -20F reading was recorded at South Burlington was back in January of 2004. This month was by far the coldest month of the season with most locations 3 to 4 degrees below average for the month. Rutland had a very cold January with an average temp of 12.9F, a full 8 degrees below average. Snow was also above average for the region during January, but once again the snow that did fall had very low water content. The highest snowfall amounts occurred over Central, Southern and Eastern Vermont with lesser amounts over Northern NY and the Champlain Valley.

By February and March winter across Northern New York and the Champlain Valley took a turn for the worse, or better, depending on your personal preference. If you like cold and snowy winters, then it was a turn for the worse. If you like warmer and drier winters, then it was a turn for the better. The interesting thing was the average temperatures across Central and Eastern Vermont stayed just slightly below average for the months of February and March, while temperatures were well above average across New York and the Champlain Valley. The most likely cause for this was the lack of snowpack on the ground during the majority of February and March across these areas. When snow is on the ground, more of the sun's energy is reflected away from the surface of the earth. When the ground is bare, more of the sun's energy is absorbed by the darker colors causing the surface of the earth to warm more. Even Tupper Lake had no snow on the ground by the end of the first week of March, but there was a persistent snowpack until Mid-March at Rutland and St. Johnsbury.

One thing that was constant across the North Country during the later half of winter was the lack of snowfall. Burlington recorded 11.3" of snow in February and 7.8" in March, well below average for these months. There was some snowfall in February, but it was very localized and confined to the spine of the Green Mountains of Vermont. March was a very low snowfall month across the board, even in the mountains with Mount Mansfield only recording 20.5". The image below indicates that all of the Northeast U.S. was below normal for precipitation, especially the Northern Adirondacks and Saint Lawrence Valley in the North Country.



Jan-Mar 2009 Precipitation compared to normal

The reason for such high variability this past winter was most likely due to the non-persistent weather pattern we experienced. Usually weather patterns become "stuck" in certain modes that can sometimes last for weeks. For example, an upper level trough (area of low pressure) will set up over the Eastern US, while a large ridge (high pressure) develops over the Western US. When these patterns become established for long periods of time you will have very similar weather conditions for weeks on end. This year the weather patterns were very progressive with the ridge and trough positions establishing themselves over an area for a week or less, before being scoured out by a different air mass. This progressive pattern is what led to the high variability in the weather pattern with numerous cold snaps and winter thaws.

The table below shows how this winter stacked up compared to historical averages. You can see that all areas of the North Country experienced above average snowfall with snowfall days running around average for Burlington & St Johnsbury, and above average at Tupper Lake and Rutland. Temperatures were slightly above average for the winter over New York and the Champlain Valley, but below average across Southern & Eastern Vermont.

Location	Snowfall (Inches)	Rank	Days >= 1" of Snow	Rank	Dec-Mar Avg Temp	Departure From Avg
Burlington	91.1	21st	21	Tied 49th	23.6	+.4
Tupper Lake	124.5	11th	39	Tied 23rd	18.7	+.1
St Johnsbury	111.6	10th	25	Tied 60th	21.4	-1.3
Rutland	94.8	5th	24	Tied 18th	23	-2.7

*** Note: data set for the period of record being used is incomplete for some years. All ranking values are therefore estimated based upon available data and shouldn't be deemed as climatologically accurate.**

National Weather Service and Google Earth

By Paul Sisson

Want to know if a tornado has ever touched down in your neighborhood and where? Where is the closest river gage? Where is the Severe Thunderstorm warning located? These questions and more can be answered by looking at National Weather Service (NWS) products and data with Geographic Information Systems (GIS) like Google Earth.

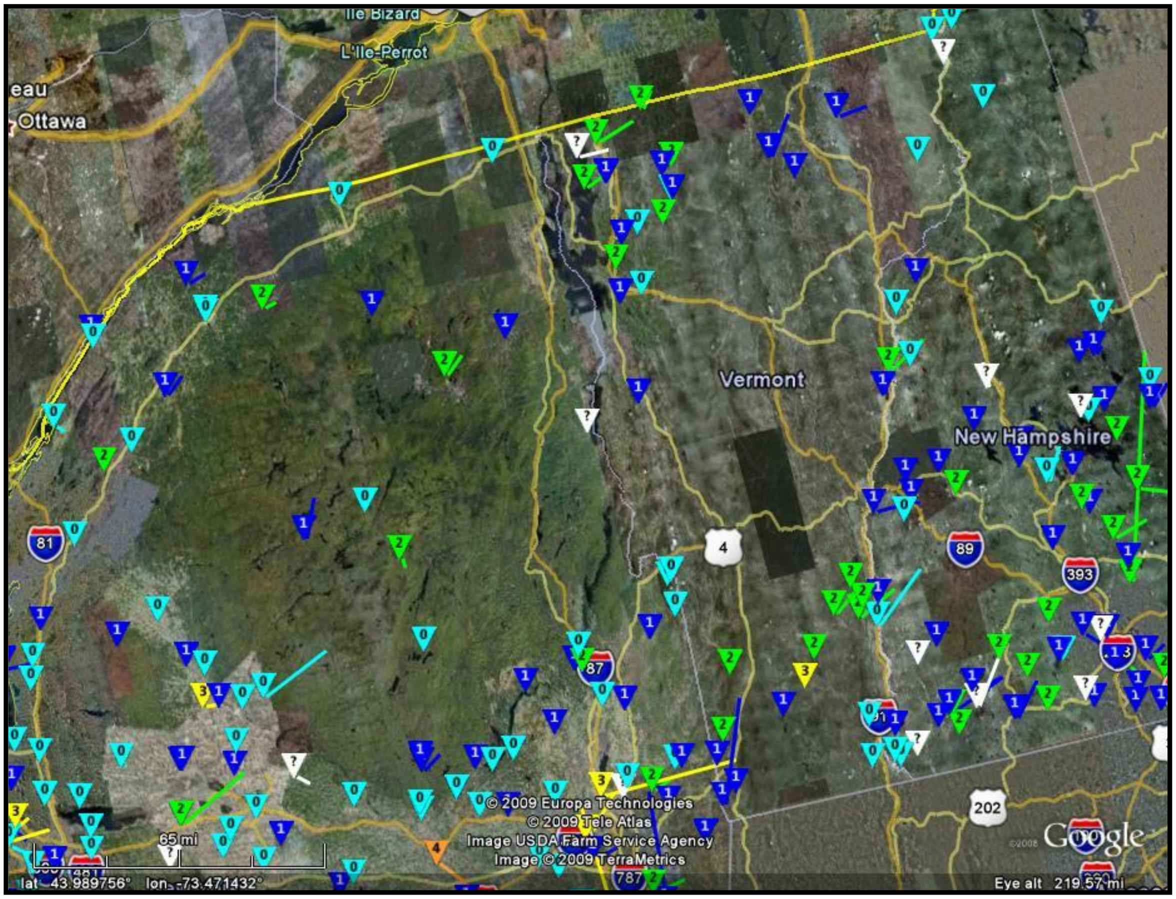
The NWS is taking advantage of GIS to provide you with data to help with emergency weather situations or making everyday decisions.

From NWS Watches and Warnings, radar, storm damage, and historical tornado track information, more and more NWS products and information are becoming available every day.

Want to see daily rain and snow reports from around the North Country and the rest of the country from the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS)?

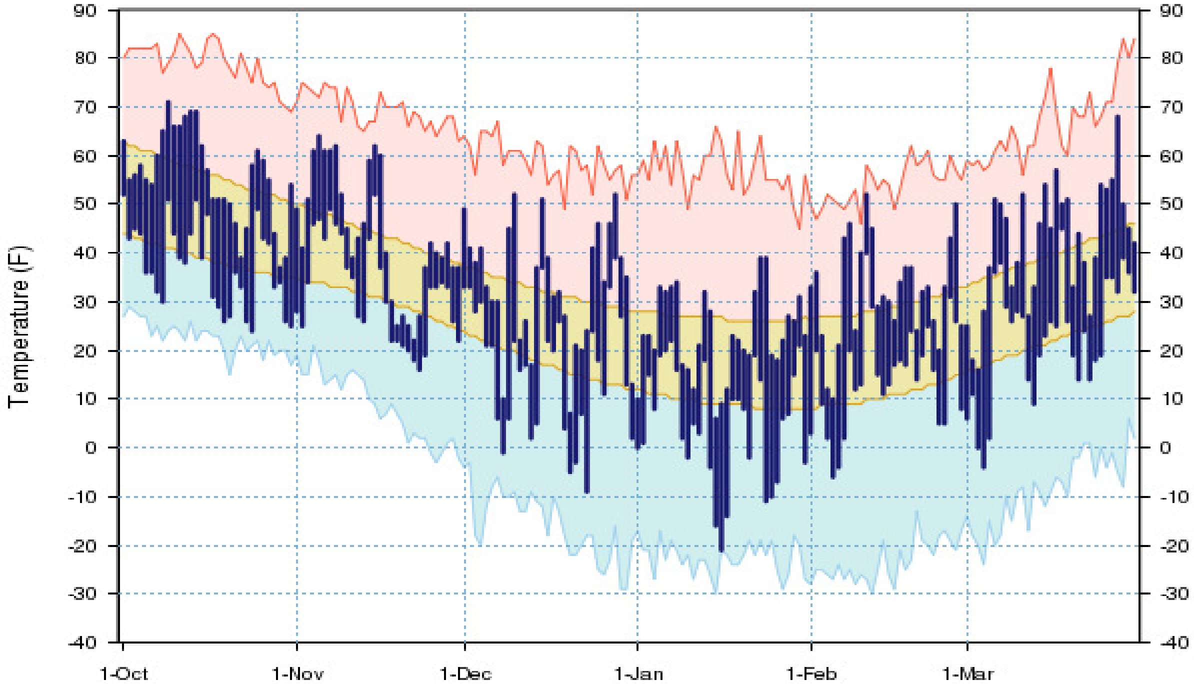
All this information can be seen On the Web at these sites:

NWS GIS info: http://weather.gov/gis/
CoCoRaHS: http://cocorahs.org/



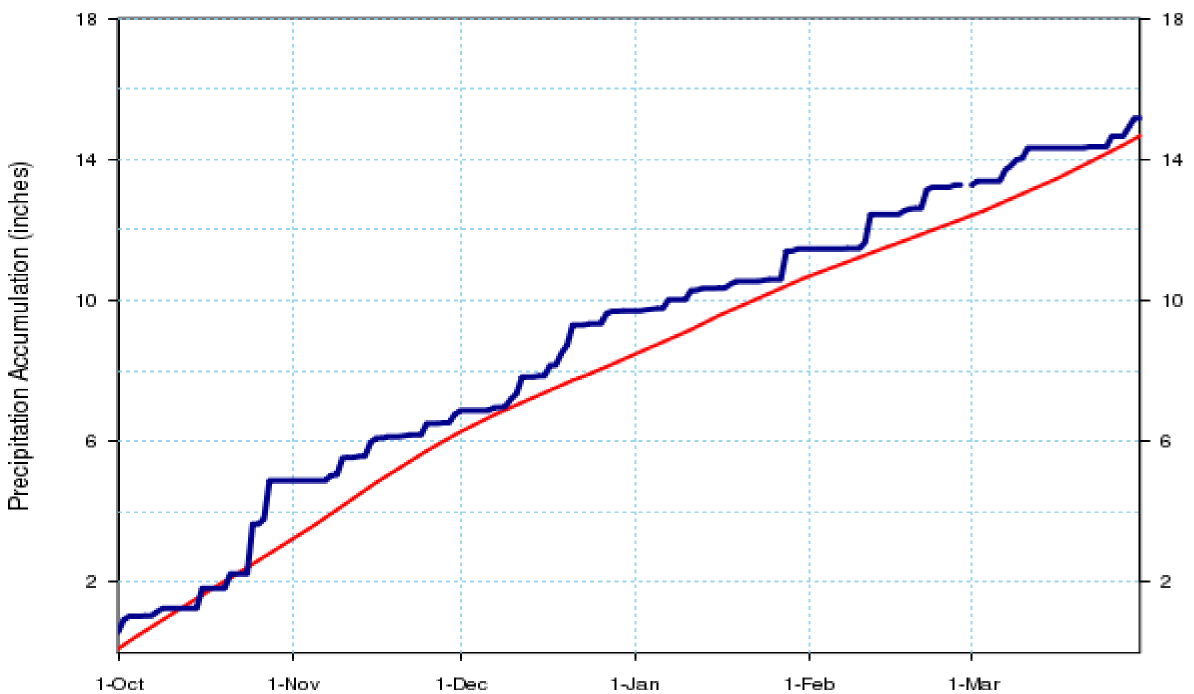
Tornado tracks and intensity 1950-2008.

Temperature Summary for Burlington Area
Oct 1, 2008 - Mar 31, 2009



Observed daily maximum and minimum temperatures are connected by dark blue bars.
Area between normal maximum and minimum temperatures has tan shading.
Red line connects record high temperatures. Light blue line connects record low temperatures.

Precipitation Summary for Burlington Area
Oct 1 - Mar 31



Heavy dark blue line is precipitation accumulation for 2008-2009. Smooth red line is normal.

VERMONT CO-OPERATIVE OBSERVER PRECIPITATION

SITE		PRECIP/SNOWFALL**					
-----		OCT	NOV	DEC	JAN	FEB	MAR
BETHEL 4N		5.15/1	3.07/9	6.36/45	3.17/33.4	2.22/15.4	2.73/5.5
NWS BURLINGTON		4.89/.3	1.88/3.5	2.93/40.3	1.76/27.8	1.81/11.3	1.9/7.8
BROOKFIELD 2SW		6.08/2	2.06/8	5.71/42.5	3.89/42.5	2.14/19	2.22/5
CANAAN		3.92/0	3.76/5.1	2.83/17.5	M / M	1.77/4.6	1.40/.3
CAVENDISH		4.65/T	3.46/2.2	6.99/36.9	3.16/32.4	2.13/17.6	2.71/7.6
CHELSEA 2 NW		5.07/3	2.45/5.2	5.42/43.2	3.12/30.6	1.85/19.3	2.08/6.0
CHITTENDEN		6.39/2.5	2.32/1.9	6.14/36.1	2.17/23.5	2.35/23.4	3.22/5.1
CORINTH		6.26/2.5	3.53/6.4	6.14/48.6	2.79/36.5	2.33/21.8	2.36/5.4
CORNWALL		5.84/.6	1.58/M	3.84/40.4	2.00/24.4	0.86/4.6	2.34/3.0
DANBY 4 CORNERS		6.37/2.4	2.71/1.8	6.19/21.6	2.59/21.1	1.97/15.7	5.11/7.5
EAST ALBANY		5.79/6	2.7/8.5	M / M	M / M	M / M	M / M
EAST HAVEN		5.44/1	3.27/4.1	4.23/34.2	2.13/33	2.35/25.6	2.13/4.1
EDEN 2S		5.69/8.6	2.85/16.9	4.54/45.3	3.87/51.1	3.06/37.8	2.57/9.7
ENOSBURG FALLS		4.81/1	1.40/1.3	2.78/27.3	1.18/18.4	1.94/15.5	1.54/4.0
ENOSBURG FALLS 2		4.61/4.2	1.55/3	2.54/26	M / 37.3	2.22/2.5	1.5/9.0
ESSEX JUNCTION 1N		5.15/1.2	1.47/1	3.35/33.1	1.94/25.7	1.96/8.2	2.18/5.2
GILMAN		3.26/0	3.68/.5	4.65/26.8	2.25/22.9	1.01/7.6	1.64/ M
GREENSBORO		5.23/0	3.69/10.0	M / 48.4	M / M	M / M	M / M
HANKSVILLE		4.98/5	3.22/17.1	4.91/39.1	1.79/30.7	2.88/29	2.35/10.1
ISLAND POND		6.33/.9	2.38/7.7	4.34/39.4	1.38/29.7	2.25/29.6	1.59/5.2
JAY PEAK		M/11.5	M/20	8.23/51	5.74/56.5	7.21/50	2.39/10
JEFFERSONVILLE		7.03/8	4.52/12	4.29/33	3.12/40.5	3.55/24	2.24/8.0
MONTPELIER 2		4.63/0	2.37/3.1	4.71/38	2.97/37.0	2.46/13.0	2.23/2
MORRISVILLE 4SSW		5.00/3.4	2.45/5.4	5.11/40.8	3.14/39.6	2.41/12	M / M
MOUNT MANSFIELD		5.97/16	5.69/47.5	7.45/55.1	5.59/51.9	7.21/41.8	5.46/20.5
NEW HAVEN		3.04/1.1	1.83/1	M /31	M / 28	M / M	M / 4.0
NEWPORT		4.53/1.6	2.92/3.5	4.25/35.5	2.11/29.9	2.61/15.8	1.56/4.7
NORTHFIELD		5.86/1	2.67/5.5	5.73/36.3	2.62/31.5	2.42/16	2.22/5.0
NORTH HARTLAND LK		4.79/0	2.11/2.7	5.88/28.7	2.36/24.9	1.35/12.2	2.6/6.8
NORTH SPRINGFIELD LK		4.20/0	3.74/1.0	6.57/28	2.90/30.1	1.69/12.0	2.56/5.0
PLAINFIELD		5.83/2.5	2.56/.4	4.98/40.8	2.29/29.8	1.78/13.1	2.12/3.6
ROCHESTER		5.10/1	2.44/3	7.39/42.5	2.99/33.7	2.75/17	2.8/4.8
RUTLAND		4.29/1	1.22/2.5	4.05/37	2.29/33.1	1.98/13.9	2.04/7.3
SAINT ALBANS		4.07/1.3	1.57/0.9	3.08/26.6	1.57/23.7	1.78/9.3	1.66/5.9
SAINT JOHNSBURY		4.71/.8	2.08/2.1	5.47/49.6	2.42/38.1	1.95/16.6	1.7/4.4
SALISBURY 2N		5.80/1.5	1.83/1.4	3.81/38.3	1.65/21	1.11/5.9	2.68/4.7
SOUTH HERO		4.80/0	1.85/.3	2.76/27.8	1.54/21.2	1.20/4	1.49/3.9
SOUTH LINCOLN		6.53/4.5	2.81/10.9	4.86/38.3	3.05/32	2.91/26.8	2.14/7.4
SOUTH NEWBURY		4.70/.3	3.41/T	6.52/32	1.53/30.5	1.13/9	.96/2.0
SUTTON		5.79/4.4	2.72/8.2	5.41/48.4	3.11/50.6	3.46/41.0	2.3/8.2

SUTTON 2NE		5.95/0	2.53/4	5.30/38.3	2.71/44.7	3.26/30.5	2.47/6.6
UNION VILLAGE DAM		4.59/T	2.63/0	5.84/28.8	2.40/26.0	1.24/8.5	2.9/5.1
WAITSFIELD 2W		5.63/3	M / M	M / M	3.14/34.7	3.28/24.3	2.63/7.5
WOODSTOCK		5.12/0	4.04/2.5	6.54/29.3	3.13/32.1	2/15.8	2.91/4.0
WORCESTER		5.75/4.6	2.47/6.4	4.79/45.5	3.24/47.0	2.21/20.1	2.74/5.8

NORTHERN NEW YORK CO-OPERATIVE OBSERVER PRECIPITATION

SITE		PRECIP/SNOWFALL**					
-----		OCT	NOV	DEC	JAN	FEB	MAR
CANTON 4SE		5.48/4.5	1.95/3.0	3.23/34.5	1.03/30	1.73/8	1.54/ T
CHAZY		M / M	M / M	M /21	M / 21.0	M / M	M / M
COLTON 2N		4.79/8	2.71/0	9.70/ M	2.42/ M	2.06/ M	1.57/ M
DANNEMORA		4.85/ M	2.39/ M	5.67 / M	2.17/ M	3.16/ M	2.54/ M
ELIZABETHTOWN		4.49/.4	2.54/4	4.43/35.5	2.42/31.6	1.19/6.5	1.94/4.7
ELLENBURG DEPOT		4.26/7	1.54/8.5	3.14/38	1.48/24.0	1.16/10.0	1.6/6.3
GOUVERNEUR 3NW		5.89/14	4.79/6.5	3.62/34.5	1.65/36	1.75/4.9	2.00/2.0
LAKE PLACID 2S		5.49/14	2.13/7.5	5.95/27.5	1.73/21.0	1.78/9.0	2.16/7.5
MALONE		4.61/12	2.52/8.0	3.71/33.0	1.36/28	1.75/15.5	1.32/3.0
NEWCOMB		4.73/5.3	2.56/7.2	6.24/43.5	2.65/34.8	2.16/14.3	3.02/6.0
OGDENSBURG 4NE		3.75/M	2.78/3	2.57/23.5	1.11/21.0	1.19/4.0	2.05/1.0
PERU 2WSW		3.22/1	1.11/2.1	3.00/31.0	1.10/17.0	M / M	1.15/4.0
TUPPER LAKE		5.32/16	2.92/11	5.24/43.5	2.25/33.5	2.43/17.5	2.09/2.5
WANAKENA SCHOOL		3.85/18	1.84/12	6.19/43.8	2.28/35.6	3.42/19.1	2.07/5.5

**** In inches. Precipitation values were compiled locally at the National Weather Service in Burlington, VT. They have not been officially verified by the National Climatic Data Center.**

National Weather Service in Burlington, Vermont.

Andy Nash - Meteorologist in Charge

Paul Sisson - Science & Operations Officer

Scott Whittier - Warning Coordination Meteorologist

Gerald Macke- Operations Program Manager (COOP)

Greg Hanson - Service Hydrologist

John Compo - Computer Specialist

Charleen Fortier – Administrative Assistant

Forecasters

Pete Banacos
Eric Evenson
John Goff
Bill Hanley
Jessica Neiles
Jason Neilson
Bob Schiesser
Brooke Taber
Aimee Fish

Met Interns

Maureen Breitbach
Conor Lahiff
Donald Dumont

Electronics Technicians

Ray Grant

Mailing address & phone number:

NATIONAL WEATHER SERVICE CO-OP
BURLINGTON INTERNATIONAL AIRPORT
1200 AIRPORT DRIVE
S. BURLINGTON, VT 05403-6028
1-802-862-2475

Web Sites of Interest

Need to know the time?
http://www.time.gov/

The Burlington Weather Forecast Office
http://www.nws.noaa.gov/er/btv/

Information on the Cooperative Observer Program:
http://www.nws.noaa.gov/om/COOP/index.htm

CO-OP Points-of-Contact

Gerald Macke
Maureen Breitbach
862-2475

If you need supplies, if your equipment is acting up, or if you need help on procedures, please let us know.

The North Country Clipper is a semi-annual free publication from the National Weather Service in Burlington, VT. If you have questions or comments regarding any information contained within, please contact Donald Dumont, editor, at donald.dumont@noaa.gov.